STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

Washington State Energy Code Development

Standard Energy Code Proposal Form

Code being amended: ☒ Commercial Provisions ☐ Residential Provisions

Code Section # C403.3.5., C403.7.3

Brief Description: Add specific sizing and control requirements for DOAS heating and cooling systems.

Proposed code change text: (Copy the existing text from the Integrated Draft, linked above, and then use underline for new text and ~~strikeout~~ for text to be deleted.)

C403.7.3 **Ventilation Air Heating Control.** For ventilation air units with supplemental heating capacity that ~~Units that provide ventilation air to multiple zones and~~ operate in conjunction with zone heating and cooling systems, ~~shall not use~~ supplemental heating ~~or heat recovery to~~ shall not warm ventilation supply air to a temperature greater than ~~60°F (16°C)~~ 55°F (13°C). ~~when representative building loads or outdoor temperature indicate that the majority of zones require cooling.~~

C403.3.5.5 Supplemental ~~Air Temperingheating and cooling~~. Supply air stream ~~tempering~~ heating in the DOAS system shall ~~be limited to~~ comply with SectionC403.7.3. Cooling is permitted for dehumidification only. Cooling coil shall be sized to meet peak dehumidification requirement at design outdoor temperatures, and no larger. Cooling coil shall be controlled to maintain supplyair RH or zone RH

Exceptions:

1. Heating permitted for defrost control shall be locked out when outside air temperatures are above 35 F. Supplemental heating for defrost shall modulate to 10% of the peak capacity, and shall be sized to prevent frost/damage the unit at design temperatures and provide supply air less than or equal to 55 F.
2. ~~Cooling is permitted for dehumidification only. Cooling coil shall be sized to meet peak dehumidification requirement at design outdoor temperatures, and no larger. Cooling coil shall be controlled to maintain supply air RH or zone RH.~~

Purpose of code change:

Adds supplemental heating and cooling capacity sizing and control requirements to DOAS systems and remains consistent with C403.7.3. The amount of supplemental heating and cooling within a DOAS system should be limited to meet basic occupant comfort needs, not overheated or overcooled to meet indoor setpoints. As heat recovery thresholds are increased within the ERV/HRV component, supplemental heat/cool within DOAS will eventually not be needed at all. The code should stay ahead of this to stop unneeded tempering of air. Adding supplemental coils to a DOAS stream brings the potential for improper controls configuration and manipulation after the building has been commissioned and occupied.

Your amendment must meet one of the following criteria. Select at least one:

☐ Addresses a critical life/safety need.

☒ The amendment clarifies the intent or application of the code.

☒ Addresses a specific state policy or statute.
(Note that energy conservation is a state policy)

☐ Consistency with state or federal regulations.

☐ Corrects errors and omissions.

☐ Addresses a unique character of the state.

Check the building types that would be impacted by your code change:

☐ Single family/duplex/townhome

☒ Multi-family 4 + stories

☒ Institutional

☐ Multi-family 1 – 3 stories

☒ Commercial / Retail

☐ Industrial

Your name Henry Odum

Email address Henry@ecotope.com

Your organization Ecotope, Inc.

Phone number (206) 596-4715

Other contact name Mark Frankel

Instructions: Send this form as an email attachment, along with any other documentation available, to: sbcc@des.wa.gov. For further information, call the State Building Code Council at 360-407-9278.

Economic Impact Data Sheet

Briefly summarize your proposal's primary economic impacts and benefits to building owners, tenants and businesses.

The prescriptive requirements for DOAS that have existing in code have the benefit of allowing certain building types with high outside air rates and long run hours to significantly reduce heating/cooling loads. The primary benefit will be reduced energy use to the building owner.

Provide your best estimate of the construction cost (or cost savings) of your code change proposal? (See OFM Life Cycle Cost **Analysis tool** and **Instructions;** use these **Inputs**. **Webinars on the tool can be found Here and Here**)

$0.00/square foot

Show calculations here, and list sources for costs/savings, or attach backup data pages

Zero cost measure. Supplemental heat/cool will likely still be provided, just a limitation on the coil sizes. Assume controls and equipment components still remain.

Provide your best estimate of the annual energy savings (or additional energy use) for your code change proposal?

0.5 to 1.0 KBTU/ square foot

Show calculations here, and list sources for energy savings estimates, or attach backup data pages

Typical office ERV/DOAS system
Limit heating to 60°F (down from an assumed 70F): DeltaT = 10F
CFM for a 20,000ft^2 office: 1,700CFM (Open office, IMC)
Total hours below 60F (Seattle): 6390/yr
Ventilation system Runtime: 8hr workdays, 5 days per week
Electric heating coil @ 100% efficient

List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

This proposal will not substantially impact code review, inspection, or enforcement. Similar to the previously developed DOAS requirements, reviewing product submittals and checking the plans for an effectiveness level, static pressure assumptions, and total fan power calculated in accordance with code is sufficient to demonstrate compliance. Field inspections would check design rated static pressure against TAB reports to confirm assumptions.

All questions must be answered to be considered complete. Incomplete proposals will not be accepted.